



A.D. 1870, 4th MARCH.

N° 640.

# SPECIFICATION

OF

WILLIAM EDWARD GEDGE.

SYRINGE FOR SUBCUTANEOUS  
EXTRACTIONS AND INJECTIONS.

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1870.







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**Syringe for Subcutaneous Extractions and Injections.**

**LETTERS PATENT** to William Edward Gedge, of the Firm of John Gedge and Son, of No. 11, Wellington Street, Strand, in the County of Middlesex, Patent Agent, for the Invention of "**AN IMPROVED APPARATUS FOR SUBCUTANEOUS EXTRactions AND INJECTIONS.**"—A communication from abroad by Georges Dieulafoy, of 39, Faubourg St. Martin, Paris, France.

Sealed the 17th June 1870, and dated the 4th March 1870.

**PROVISIONAL SPECIFICATION** left by the said William Edward Gedge at the Office of the Commissioners of Patents, with his Petition, on the 4th March 1870.

I, WILLIAM EDWARD GEDGE, of the Firm of John Gedge and Son, of No. 11, Wellington Street, Strand, in the County of Middlesex, Patent Agent, do hereby declare the nature of the said Invention for "**AN IMPROVED APPARATUS FOR SUBCUTANEOUS EXTRactions AND INJECTIONS,**" a communication to me from abroad by Georges Dieulafoy, of 39, Faubourg St. Martin, Paris, France, to be as follows:—

10 The syringe the subject of this Invention is composed as illustrated, Fig. 1 of the accompanying Sheet of Drawing, of a pump barrel, to



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*Gedge's Improved Syringe.*

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which are fixed at P and G two short tubes or cannula pieces, each provided with a cock, and having an inner screw thread for the fixing of a trocar or of an ordinary cannula.

For subcutaneous extractions the end of the cannula piece P is fitted with a trocar of the required length (on reference to Fig. 2 it will be observed that the trocar is pierced with several holes to avoid obstruction), and after its introduction into the part to be explored it is only necessary to create a vacuum in the syringe to draw out the matter sought for.

In case of continuous puncture or tapping another piece of ordinary cannula will be added to that G, and when the barrel or chamber of the syringe is filled with matter to be ejected the cock of the cannula P will be closed, that of the cannula G opened, and the contents of the syringe will be forced out. This operation may be repeated as many times as may be required without the necessity of displacing the apparatus. 15

To transform this extractor into an injector it will only be necessary to fit it with an ordinary trocar cannula, that is to say, one pierced at the end with but a single hole (see Fig. 3), and to introduce this cannula into the part to be injected, care being had to keep the cock P closed, the cannula G will be made to dip into the liquid to be injected, the cock G will be opened and the liquid sucked into the syringe, then the cock G will be closed, that P opened, the liquid injected, and so on. 20

When it is desired to use this instrument for local anæsthesia an ordinary cannula will be fitted to P, care being taken that this cannula is pierced with as small a hole as possible. The syringe will be filled with ether, and the time indispensable for emptying the syringe on to the parts to be treated will be sufficient to produce complete anæsthesia. The piston rod of this syringe may be graduated by means of a screw thread and a nut E to regulate its stroke, and thereby to regulate the dosing whether for extraction or injection. By a special arrangement of the piston rod the vacuum may be maintained in the pump barrel so long that the liquid to be sucked in shall enter it by the simple effect of the vacuum. The vacuum being formed by the simple traction of the piston rod the question is how to preserve it, and for this purpose a notch is made in the lower part of the piston rod, and a projection on that part of the cover of the pump barrel which forms socket; the rod 25 30 35



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*Gedge's Improved Syringe.*

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being at the end of its stroke it is only necessary to give it a slight turn to place the projection in the notch and form a stop, as shewn, Figs. 4 and 5, or the rod may be fixed by any suitable device. The suction then takes place simply under the influence of atmospheric pressure, 5 whether it be for the introduction into the pump barrel of a subcutaneous liquid or of a medicinal liquid to be injected.

These various operations may be effected without withdrawing the trocar from the wound, and consequently without inflicting this pain, an important result considering that hitherto the removal of the trocar 10 was imperative, if not at each operation, at least at each part of the operation.

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**SPECIFICATION** in pursuance of the conditions of the Letters Patent, filed by the said William Edward Gedge in the Great Seal Patent Office on the 1st September 1870.

15 **TO ALL TO WHOM THESE PRESENTS SHALL COME, I, WILLIAM EDWARD GEDGE, of the Firm of John Gedge and Son, of No. 11, Wellington Street, Strand, in the County of Middlesex, Patent Agent, send greeting.**

**WHEREAS** Her most Excellent Majesty Queen Victoria, by Her 20 Letters Patent, bearing date the Fourth day of March, in the year of our Lord One thousand eight hundred and seventy, in the thirty-third year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said William Edward Gedge, Her special licence that I, the said William Edward Gedge, my executors, administrators, and 25 assigns, or such others as I, the said William Edward Gedge, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and 30 Ireland, the Channel Islands, and Isle of Man, an Invention for "**AN IMPROVED APPARATUS FOR SUBCUTANEOUS EXTRACTIONS AND INJECTIONS,**" a communication to me from abroad by Georges Dieulafoy, of 39, Faubourg St. Martin, Paris, France, upon the condition (amongst others) that I, the said William Edward Gedge, my executors or administrators, by an



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*Gedge's Improved Syringe.*

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instrument in writing under my, or their, or one of their hands and seals, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters 5 Patent.

**NOW KNOW YE**, that I, the said William Edward Gedge, do hereby declare the nature of the said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement, reference being had to the accompanying 10 Sheet of Drawing, and to the figures and letters of reference placed thereon:—

The apparatus the subject of this Invention will be found of great service to medical science for all subcutaneous operations. With this apparatus, termed by the Inventor “a pneumatic aspirator,” it is easy 15 to penetrate with impunity into the depth of the tissues without fear of injuring the most delicate organs, to there discover serous, purulent, hematic, or urinous collections, and to ascertain by this exploration whether surgical intervention is useful, urgent, or hurtful. It is also intended to be used for producing local anæsthesia more rapidly than by 20 the means hitherto known and used.

This “aspirator” is composed of a pump barrel, to which are fixed two short tubes or cannula joints (P, G, Fig. 1), each provided with a tap, and having an inner screw thread at their ends to permit the fixing on 25 of a trocar or of an ordinary cannula.

In the above-mentioned cases of subcutaneous explorations the cannula joint P is fitted with a trocar cannula, as at Fig. 2, but of any required length. It will be observed that the end of this cannula is pierced with several holes to prevent obstruction, and after its introduction into the part to be explored it will only be necessary to create a 30 vacuum in the barrel to bring into it the matter sought for.

In case of continuous puncture an ordinary cannula joint will be fitted to the cannula joint G, and when the barrel of the instrument is filled with the matter to be ejected the tap of the cannula joint P will be closed, that of the cannula joint G opened, and its contents forced out. 35 This operation may be repeated as often as may be required without displacement of the apparatus.



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*Gedge's Improved Syringe.*

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To transform the "aspirator" into an ejector all that is required is to fit it with an ordinary trocar cannula, that is to say, a cannula having but a single opening near its end, as at Figure 3. This cannula will then be introduced into the part to be injected, care being had to keep  
5 the tap on P closed, the annula G will be plunged into the liquid to be injected, the tap on G will be opened, the liquid will then be sucked into the barrel, the tap on G closed, that on P opened, the liquid injected, and so on.

When it is desired to use this instrument for local anæsthesia an  
10 ordinary cannula will be fitted on to P, care being taken that the extremity of this cannula is pierced with as small a hole as possible. The barrel of the instrument will be filled with ether, and the time indispensable for emptying it on to the parts to be treated will suffice for the production of complete anæsthesia. The piston rod of this  
15 "aspirator" may be graduated by means of a screw thread and a nut to determine its stroke, and on the other hand to establish a proportion or dosing whether for extraction or injection. By a special arrangement of the piston rod the vacuum may be maintained in the pump barrel long enough to permit the liquid which is to be sucked in to enter it  
20 by the simple effect of the vacuum. The vacuum being obtained by the simple traction of the piston rod, the question remains how to preserve it, and for this purpose a notch is made in the lower part of the piston rod and a catch in the cover of the pump barrel; when the rod has been drawn out to the full extent it is only requisite to give it a slight  
25 turn to place the notch on the catch, and thus hold the rod, as at Fig. 4. The suction or "aspiration" then takes place simply under the influence of atmospheric pressure whether it has for object the introduction into the barrel of a subcutaneous liquid or the injection of a medicinal liquid.

30 These various operations may be effected without withdrawing the trocar from the wound, and consequently without inflicting this pain, an immense result when it is considered that it has hitherto been necessary to withdraw it at each operation, or at least at each part of the operation. For further security a flexible tube is placed between the "aspirator"  
35 and the cannula, whereby the operator is enabled to manœuvre the instrument in every possible way without disturbing the cannula (see Fig. 5).



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*Gedge's Improved Syringe.*

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The principle of the subcutaneous “pneumatic aspirator” rests upon two points, which are,—

- 1°. The fineness and the length of the needles or cannulas.
- 2°. The application of a preliminary vacuum.

The fineness and the length of the needles permit passage through the 5 most deeply seated organs without fear of accident, but the really essential point is the application of a preliminary vacuum. The “aspirator” becomes by this device a real pneumatic machine or air pump; thus the tissues to be explored are traversed with a needle carrying the vacuum with it, and directly a collection of fluid is met 10 with in its passage this liquid is seen to precipitate itself into the glass pump barrel.

To transform the “aspirator” into an air pump it has sufficed to make a notch along the piston rod to stop it at the top of its stroke. The same object might be attained by many other means, but the principle and 15 the method would be in nowise modified.

Having now described the nature of the said Invention communicated to me as aforesaid, I desire it to be understood that although it is preferred that the barrel of the apparatus be of glass, that this and the other parts of the apparatus may be of any suitable material, that the 20 dimensions may vary at will, and that what I claim as novel and secured to me by the herein-before in part recited Letters Patent is, the application of the preliminary vacuum, substantially as and for the purposes herein-before set forth.

In witness whereof, I, the said William Edward Gedge, have 25 hereunto set my hand and seal, this Thirtieth day of August, in the year of our Lord One thousand eight hundred and seventy.

W. E. GEDGE. (L.S.)

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Printers to the Queen's most Excellent Majesty. 1870.















FIG. 3.



FIG. 4.

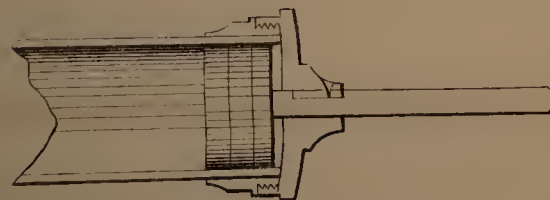


FIG. 1.

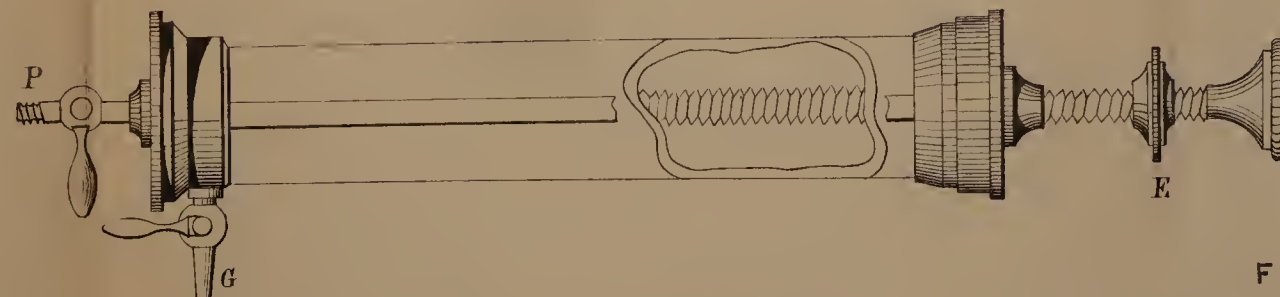


FIG. 5.

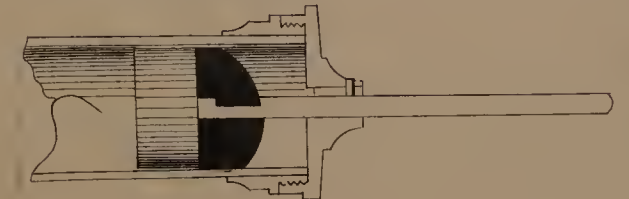


FIG. 2.



*The filed drawing is partly colored.*

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FIG. 1.

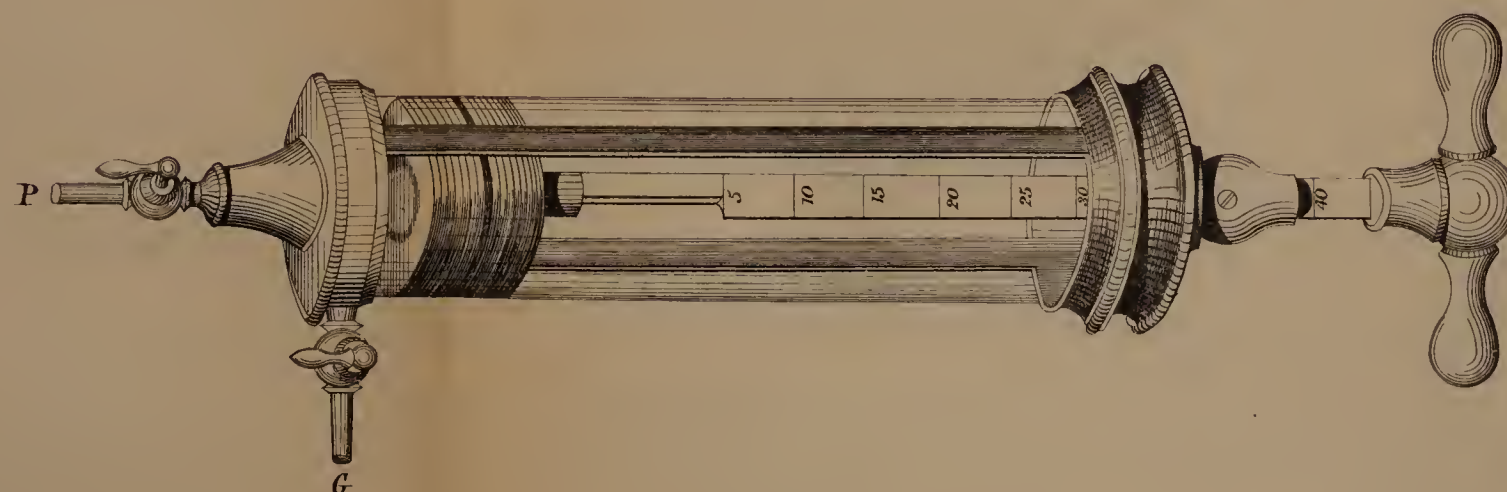


FIG. 2.

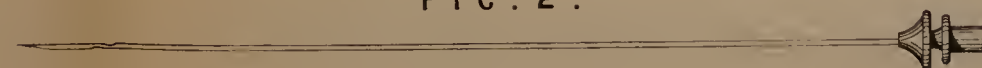


FIG. 3.

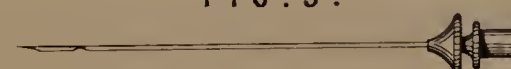
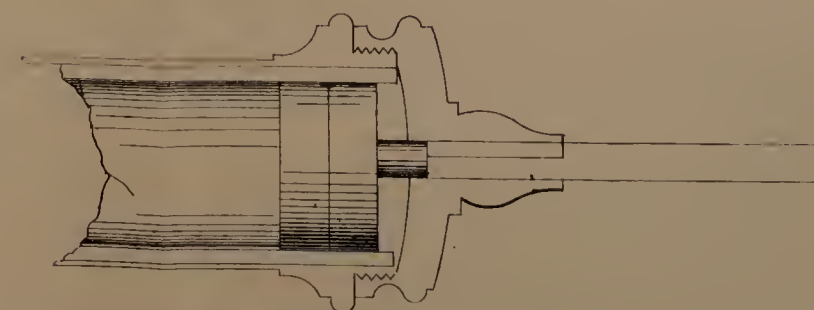


FIG. 5.



FIG. 4.



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